National Institute of Environmental Health Sciences

The effect of climate change and air pollution on allergenic potential of pollens

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Abstract:

Climate change is associated with atmospheric warming due to continuous increase in anthropogenic greenhouse gas concentration following the industrial revolution. The urban areas are more responsible for these changes. Europe for example has experienced a progressive warming +0.9 degrees C for 1901-2005. Climate change is unequivocal and represents a possible threat for patients affected by allergic conditions because it is related with an increased distribution and concentration of pollen. Higher temperature, wet condition (especially thunderstorms), wind speed, transition of cold fronts, environmental changes (allergenic pollens arrived in new areas), are mechanisms which involve changes of production, dispersion and allergen content of pollen. Prolonged and more severe pollen seasons are leading to worsened asthma and allergies. The interaction of pollen with urban air pollutants could also lead to an increased effect of aeroallergens on allergic patients, with a greater likelihood of the development of an allergic respiratory disease in sensitized subjects and exacerbation of symptomatic patients. Air pollution could induce damage to airways mucosa, thus promoting sensitization of the airways; also it could increase the expression of allergenic proteins (allergen contents of pollen produce by plants is increased by higher temperature and CO2 enriched atmosphere). By increasing pollen concentration or making the airways susceptible to allergens, the climate change and air pollution have a negative impact on human health.

Source: http://www.notulaebotanicae.ro/index.php/nbha/article/view/9291

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Precipitation

Air Pollution: Allergens, Interaction with Temperature, Particulate Matter

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

Health Impact: M

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma, Upper Respiratory Allergy

Resource Type: M

format or standard characteristic of resource

Review

Timescale: M

time period studied

Time Scale Unspecified